TECHNICAL REVIEW DOCUMENT
for
MODIFICATION TO OPERATING PERMIT 96OPAD130

Public Service Company of Colorado – Cherokee Station
Adams County
Source ID 0010001

Prepared by Jacqueline Joyce
February 2012

I. Purpose:

This document establishes the decisions made regarding the requested modification to the Operating Permit for Public Service Company of Colorado's Cherokee Station. This document provides information describing the type of modification and the changes made to the permit as requested by the source and the changes made due to the Division's analysis. This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the information provided in the requests for modification submitted to the Division on February 13, 2012, e-mail correspondence and telephone conversations with the source. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Permit Modification Request/Modification Type

The Operating Permit for Cherokee Station was issued on February 1, 2002 and was renewed on April 1, 2010. Public Service Company of Colorado (PSCo) submitted a request to modify the permit on February 13, 2012 to install a new emergency fire pump engine, revise the monitoring for the existing emergency generators and to make a change to the insignificant activity list in Appendix A.

Colorado Regulation No. 3, Part C, Section X.A identifies those modifications that can be processed under the minor permit modification procedures. Specifically, minor permit modifications "are not otherwise required by the Division to be processed as a

significant modification" (Colorado Regulation No. 3, Part C, Section X.A.6).

The Division requires that "any change that causes a significant increase in emissions" be processed as a significant modification (Colorado Regulation No. 3, Part C, Section I.A.7.(a)). According to Part G of Regulation No. 3 (Section I.L, revisions adopted July 15, 1993, Subsection I.G for modifications) the Division considers that a significant increase in emissions is the potential to emit above the PSD significance. In their application, the source estimated emissions from the emergency fire pump engine based on 500 hours per year of operation. A September 5, 1995 EPA Guidance memo indicates that potential to emit (PTE) from emergency generators may be based on 500 hours per year of operation. The Division considers that use of 500 hours per of operation is appropriate for use in estimating the PTE of emergency fire pump engines. The source's estimated emissions were based on manufacturer's emission estimates. The tables below show that based on either manufacturer's emission estimates or the NSPS emission limitations and either 500 hours or 8760 hours per year of operation, emissions from the emergency fire pump engine are much less than the NANSR/PSD significance levels. Therefore, since the PTE of the proposed new fire pump engine is below the NANSR/PSD significance levels, this modification qualifies as a minor modification.

Table 1: Emissions Based on Manufacturer's Emission Rates

Scenario	NO_X	CO	VOC	$PM/PM_{10}/PM_{2.5}$[1]	SO_2
Emission Factor (g/hp-hr)	2.2	1.417	0.123	0.118	
Emission Factor (lb/Mgal)[2]					0.212
Emissions (lb/hr)	1.37	0.88	7.65E-02	7.34E-02	3.10E-03
Emissions in tons/yr at 500 hrs/yr	0.34	0.22	1.91E-02	1.83E-02	7.74E-04
Emissions (tons/yr) at 8760 hrs/yr	5.99	3.86	3.35E-01	3.21E-01	1.36E-02
PSD/NANSR significance level (T5 Minor Mod Level)	40	100	40	25/15/10	40

[1] $PM = PM_{10} = PM_{2.5}$

[2] SO_2 emission factor based on 15 ppm S in fuel limit from NSPS and fuel density of 7.05 lb/gal

Table 2: Emissions Based on NSPS Limitations

Scenario	NOX	CO	VOC	$PM/PM_{10}/PM_{2.5}$[1]	SO_2
Emission Factor[2] (g/hp-hr)	3	2.6		0.15	
Emission Factor (lb/Mgal)[3, 4]			49.32		0.212
Emissions (lb/hr)	1.87	1.62	7.20E-01	9.33E-02	3.10E-03
Emissions (tons/yr) at 500 hrs/yr	0.47	0.40	0.18	2.33E-02	7.74E-04
Emissions (tons/yr) at 8760 hrs/yr	8.17	7.08	3.15	4.08E-01	1.36E-02
PSD/NANSR significance level (T5 Minor Mod Level)	40	100	10	25/15/10	40

[1] $PM = PM_{10} = PM_{2.5}$

[2] Since there is no CO NSPS limit for 2009 and later, the CO NSPS limit for 2008 and earlier was used.

[3] SO_2 emission factor based on 15 ppm S in fuel limit from NSPS and fuel density of 7.05 lb/gal

[4] VOC emission factor from AP-42, Section 3.3 (dated 10/96), Table 3.3-1 (exhaust + crankcase = 0.36 lb/MMBtu) converted to lb/Mgal based on diesel heat content of 137,000 Btu/gal

In addition, the Division requires that "any change that is considered a modification under Title I of the Federal Act" be processed as a significant permit modification (Colorado Regulation No. 3, Part C, Section I.A.7.b). Part G of Regulation 3 Section I.L, revisions adopted July 15, 1993, Subsection I.G for modifications) describes more specifically what constitutes a modification under Title I of the Federal Act and it indicates that a modification which triggers either Section 111 ((new source performance standards (NSPS)) or 112 (national emission standards for hazardous air pollutants (NESHAP))) requirements is considered a Title I modification. This emergency fire pump engine is subject to the provisions in 40 CFR Part 60 Subpart IIII (NSPS requirements) and 40 CFR Part 63 Subpart ZZZZ (NESHAP requirements). However, the Division has considered that modifications that trigger either NSPS or NESHAP requirements that consist of non-substantive requirements such as work practices or recordkeeping requirements can be processed as a minor modification. In addition, the Division considers that if the NSPS or NESHAP specifies that compliance may be demonstrated by the purchase of compliant equipment and that no other compliance demonstration is necessary provided compliant equipment is purchased than such modification can be processed as a minor modification. Although the emergency fire pump engine is subject to emission limitations under NSPS Subpart IIII, since the source will meet the requirements by using a certified engine, this modification can be processed as a minor modification. The requirements in the 40 CFR Part 63 Subpart ZZZZ specify that the NESHAP requirements are met by meeting the requirements in NSPS Subpart IIII. Therefore, although NSPS and NESHAP requirements are triggered, the Division agrees that this modification can be processed

as a minor modification.

The Division requires that "every significant change in existing monitoring permit terms or conditions" be processed as a significant modification (Colorado Regulation No. 3, Part C, Section I.A.7.f). The current permit requires that Method 9 opacity observations be conducted on the emergency generators annually. The source has requested that the permit clarify that a Method 9 observation is not required if the engine does not run during the annual period. The Division does not consider this change to be a significant change in existing monitoring. Therefore, the Division agrees that this change can be processed as a minor modification.

III. Modeling

With the exception of short-term NO_X, emissions from the emergency fire pump engine are below modeling thresholds specified in the Division's Colorado Modeling Guideline's May 20, 2011 Updated Tables as indicated in the table below, therefore, modeling is not warranted for this modification.

In accordance with PS Memo 10-01 (see pages 10-11) the Division's Stationary Sources Program has indicated that for minor source's with requested NO_X and SO_2 emissions less than 40 tons/yr that a compliance demonstration for the short-term (hourly) NO_2 and SO_2 national ambient air quality standards (NAAQS) is not required. Therefore, a modeling analysis was not conducted to assess compliance with the short-term NO_2 NAAQS.

Pollutant	Modeling Threshold		Project Emissions	
	Annual	Short-Term	Annual*	Short-Term
CO	100 tons/yr	23 lbs/hr	7.08 tons/yr	1.62 lbs/hr
NO_X	40 tons/yr	0.46 lbs/hr	8.17 tons/yr	1.87 lbs/hr
SO_2	40 tons/yr	0.46 lbs/hr	1.36E-02 tons/yr	3.10E-03 lbs/hr
PM_{10}	15 tons/yr	82 lbs/day	4.08E-01 tons/yr	2.24 lbs/day
$PM_{2.5}$	5 tons/yr	11 lbs/day	4.08E-01 tons/yr	2.24 lbs/day

*Based on 8760 hrs/yr of operation and NSPS emission limitations (see Table 2).

IV. Discussion of Modifications Made

Source Requested Modifications

The Division addressed the source's requested modifications as follows:

New Fire Pump Engine

Provisions for the new emergency fire pump engine will be included in Section II.17 (this section previously included the regional haze requirements).

Cummins, Model No. CFG9E-F20, Diesel-Fuel Fired Internal Combustion Engine,

Rated at 282 hp and 14.6 gal/hr. Serial No. 73335121. This Engine Drives an Emergency Fire Pump.

This engine was ordered October 11, 2011 and was manufactured in November 2011. The engine has a displacement of 1.48 liters/cylinder.

1. Applicable Requirements: The following requirements apply to the proposed new emergency fire pump engine:

- Construction of this source must commence within 18 months of initial approval permit issuance date or within 18 months of date on which such construction or activity was scheduled to commence as stated in the application (Reg 3, Part B, Section III.F.4.a.(i) thru (ii)).

- Within 180 days after commencement of operation, compliance with the conditions contained on this permit shall be demonstrated to the Division (Reg 3, Part B, Section III.G.2).

- The permittee shall notify the Division, in writing, fifteen (15) days after startup (Reg 3, Part B, Section III.G.1).

- Except as provided for below, visible emissions shall not exceed 20% opacity (Reg 1, Section II.A.1)

- Visible emissions shall not exceed 30% opacity, for a period or periods aggregating more than six (6) minutes in any sixty (60) minute period, during fire building, cleaning of fire boxes, soot blowing, start-up, process modifications, or adjustment or occasional cleaning of control equipment (Reg 1, Section II.A.4)

  Based on engineering judgment, the Division believes that the operational activities of fire building, cleaning of fire boxes and soot blowing do not apply to diesel engines. In addition, since this engine is not equipped with control equipment the operational activities of adjustment or occasional cleaning of control equipment also do not apply to this engine. Finally, based on engineering judgment, it is unlikely that process modifications will occur with the emergency generator. Therefore, for this unit the 30% opacity provision only applies during startup.

- Emission and fuel consumption limits.

  The APEN submitted for this engine was based on 500 hrs/yr of operation and at that level of operation emissions of all pollutants are below the APEN de minimis level. This engine is subject to APEN reporting and minor source construction permit requirements based on the “catch-all” provisions that state that the APEN and minor source construction permit exemptions do not apply if the emission unit is subject to requirements in Colorado Regulation No. 6, Part A. Since the Division adopted the provisions in NSPS Subpart IIII into Colorado Regulation

No. 6, Part A, the "catch-all" provisions are in effect. Because emissions at the expected rate of operation are below the APEN de minimis level, no emission or fuel consumption limitations will be included in the permit for this engine. However, the permit will limit hours of operation to 500 hours per year.

- SO_2 emissions from the emergency fire pump engine shall not exceed 0.8 lb/MMBtu (Reg 1, Section VI.B.4.b.(i))

  Note that since NSPS IIII sets limitations on fuel that are well below the 0.8 lb/MMBtu (15 ppm S, which is equivalent to 1.55×10^{-3} lb/MMBtu), this requirement will be streamlined out in favor of the NSPS IIII fuel limitations.

- RACT for NO_X, CO and PM_{10} shall be met by complying with the NSPS Subpart IIII requirements (Reg 3, Part B, Section III.D.2.a)

- RACT for VOC shall be met by complying with the NSPS Subpart IIII Requirements (Reg 3, Part B, Section IIII.D.2.a and Reg 7, Section II.C.2)

- 40 CFR Part 60 Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines", as adopted by reference in Colorado Regulation No. 6, Part A, as follows:

  - Emission limitations per § 60.4205(c)

  - Emission limitations shall be met for the time period specified in § 60.4206

  - Fuel requirements per § 60.4207

  - Monitoring requirements per § 60.4209

  - Compliance requirements per § 60.4211

  - Notification, reporting and recordkeeping requirements in § 60.4214

  - General Provisions in § 60.4218.

    40 CFR Part 60 Subpart IIII § 60.4218 identifies the general provisions (40 CFR Part 60 Subpart A) that apply. According to the table, the provisions in § 60.7 (notification and recordkeeping) apply as specified in § 60.4214(a) and this section does not apply to this engine, therefore, the provisions in § 60.7 do not apply. The table also indicates that § 60.8 (performance testing) and § 60.13 (monitoring requirements) only apply to engines with a displacement greater than or equal to 30 liters per cylinder and therefore do not apply to this engine. In addition, the table indicates that the provisions in § 60.11 do not apply as the requirements are specified in Subpart IIII.

    Therefore, the relevant general provisions are the circumvention provisions (§ 60.12).

2. Emission Factors: Approval of emission factors is necessary to monitor compliance with the permit limitations. Emissions from this project are based on the following emission factors.

Pollutant	Manufacturer's Emission Rates[1]	
	lb/hr	lb/Mgal[2]
PM	7.34E-02	5.0
PM_{10}	7.34E-02	5.0
$PM_{2.5}$	7.34E-02	5.0
NO_X	1.37	93.8
VOC	7.65E-02	5.2
CO	0.88	60.3

[1]Emission factors based on manufacturer's emission rates (Table 1), not the NSPS IIII limitations (Table 2). Assumes PM = PM_{10} = $PM_{2.5}$.
[2]Converted to lb/Mgal based on the manufacturer's maximum fuel usage rate at 1,760 rpm (14.6 gal/hr).

SO_2 emissions are based on a fuel sulfur content of 0.0015 % by weight. This results in an emission factor of 0.21 lb/Mgal, assuming a diesel density of 7.05 lb/gal.

Emission and throughput limits were not included in the permit since at the levels reported on the APEN (based on 500 hours/yr of operation) emissions of all pollutants are below the APEN de minimis levels. In addition, the permit will not include a requirement to calculate emissions from this emission unit to determine if a revised APEN is necessary. A revised APEN for this emission unit is required every five next (next APEN due February 13, 2017).

3. Monitoring Plan: The source shall be required to record hours of operation monthly and maintain a rolling twelve month total. EPA Reference Method 9 observations shall be required to monitor compliance with the opacity requirements. Compliance with the sulfur dioxide requirements shall be presumed provided the diesel fuel meets the sulfur limitation.

Section II.4 – Emergency Generators

The source requested that the permit be revised to indicate that if the engine doesn't run during the annual period, then no Method 9 opacity observation is required. The Division revised the language in Condition 4.4 to indicate that no Method 9 opacity observation is required if the engine is not operated during the annual period. The permit was also revised to simplify the opacity monitoring requirements similar to the opacity monitoring language included in the recently revised Title V permit issued for Pawnee Station. Specifically, the language in Condition 4.4.3 was revised to limit engine startup to 30 minutes and Condition 4.4.4 was removed. The monitoring language in Condition 4.4.5 was revised to indicate the annual period is a calendar year (this is consistent with the annual compliance period specified for this permit) and to require an additional Method 9 observation if the engine were operated for more than 250 hrs in the annual period. In addition, formatting changes were made, so the monitoring language spans several conditions in order to more clearly indicate the

requirements.

Insignificant Activity List – Appendix A

A 500 gal diesel fuel tank was added to the insignificant activity list as requested.

Other Modifications

In addition to the requested modifications made by the source, the Division used this opportunity to include changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this modification.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments on other permits, to the Cherokee Station Operating Permit with the source's requested modifications. These changes are as follows:

Page Following Cover Page

- Changed the permit contact.
- Changed the company address.

Section I - General Activities and Summary

- Included the size (hp) of the emergency generators in the table in Condition 6.1.

Section II.10 – Continuous Emissions and Opacity Monitoring Systems

- The phrase "may elect to" in the first paragraph of Condition 10.4.3 was replaced with "shall".

Section II.17 – Regional Haze Requirements

- Section II.17 includes requirements from Colorado Construction Permit 07AD0108B, which was issued to address best available retrofit (BART) requirements. PSCo requested that this permit be cancelled on April 27, 2011. The emission limitations included in the BART construction permit (07AD0108B), were also included Colorado Regulation No. 3, Part F and was part of the Division's regional haze state implementation plan (SIP) that was submitted to EPA Region 8 in 2009. EPA indicated that the SIP was not approvable; therefore, the Division addressed the issues raised by EPA and the regional haze requirements for BART units were included in Colorado Regulation No. 3, Part F, which was adopted by the AQCC in January 2011. Since the BART analyses conducted in 2007-2008 were revised and replaced by the January 2011

changes to Regulation No. 3, Part F, PSCo requested that their BART construction permit (07AD0108B) be canceled on April 27, 2011. Therefore, Section II.17 was removed from the permit. Note that the regional haze requirements included in Reg 3, Part F have not been included in the permit at this time as inclusion of these requirements would not qualify as a minor modification but will be included at the next permit renewal or significant modification for this facility.

Section III – Acid Rain Requirements

- Changed the designated representative and alternate designated representative.

Appendices

- Included the size (hp) of the emergency generators in the tables in Appendices B and C.

- Changed the Division contact for reports in Appendix D.